

# *Development of Biologically-Based Strategies for Managing Insect Pests of Horticultural Crops*

## **ARS LOCATION:**

Horticultural Crops Research Unit  
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## **PRINCIPAL INVESTIGATORS:**

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## **PROJECT OBJECTIVES:**

1. Impact of Spotted wing Drosophila (SWD) in wine grapes.
2. Role of mycophagous ladybugs as an indicator of powdery mildew.
3. Effect of methyl salicylate on predatory mites in vineyards.

## **MAJOR ACCOMPLISHMENTS (2007–2010):**

### Spotted wing Drosophila:

Research on wine grapes has just been initiated with this new invasive pest. Daily fecundity of flies given Pinot Noir is being monitored. The effect of no, low, and high infestation rates of SWD on grape damage is ongoing in the field. Field trials are being performed on the four most common varieties in Oregon (Pinot Noir, Pinot Gris, Merlot, and Chardonnay).

### Mycophagous ladybugs:

The mycophagous ladybug, *Psyllobora vigintimaculata*, was an indicator of powdery mildew in vineyards; the same fields with ladybugs also had detected powdery mildew spores via spore traps. Sticky traps are a cheaper monitoring tool but not as sensitive as spore traps. The first ladybug appeared 4 weeks after spores were detected in the nearby spore trap.

### Methyl salicylate (MeSA):

*Typhlodromus pyri*, a predator of grapevine rust mite was attracted to MeSA in Y-tube olfactometer assays. Significantly higher proportions of *T. pyri* preferred MeSA at doses of 0.02, 0.2, and 20 $\mu$ g. Employing MeSA may attract and retain predatory mites in vineyards enhancing biological control of grapevine rust mite, and vineyard trials are ongoing with MeSA and field populations.

## **TECHNOLOGY TRANSFER/OUTREACH:**

Two-page research summary sent to vineyard growers on the effectiveness of mycophagous ladybugs relative to spore traps using DNA-detection for monitoring powdery mildew.

Recommendations for SWD monitoring and management for PNW wine grape growers available on the SWD regional Web site: <http://swd.hort.oregonstate.edu/>.

**EXTERNAL SUPPORT:** N/A

**COLLABORATORS:**

Vaughn Walton (Spotted wing Drosophila and methyl salicylate) and Angela Gadino (methyl salicylate), Oregon State University, Corvallis, OR; and Walt Mahaffee (Mycophagous lady beetle), ARS Corvallis, OR.

**RECENT PUBLICATIONS:**

- Lee, J., A. Albrecht, D. Lightle, D. Martin, W. Mahaffee. Mycophagous ladybugs, an indicator of powdery mildew in vineyards? Pacific Northwest Pest Management Conf., Portland, OR. Jan 2010.